



W H Allen- 1914 to 1950

W. H. Allen Sons & Co Ltd, Queens
Engineering Works, Bedford.

Bunyan Meeting Hall 1st October 2024
by Philip Mann (WH Allen employee Sept 1968 to Dec 2018)

The Great War Years 1914-1919

The war started with Allens having adequate capacity at Queen's Engineering Works to meet the demands of the Admiralty and still leave capacity for fulfilling orders for land pumps and other traditional products.

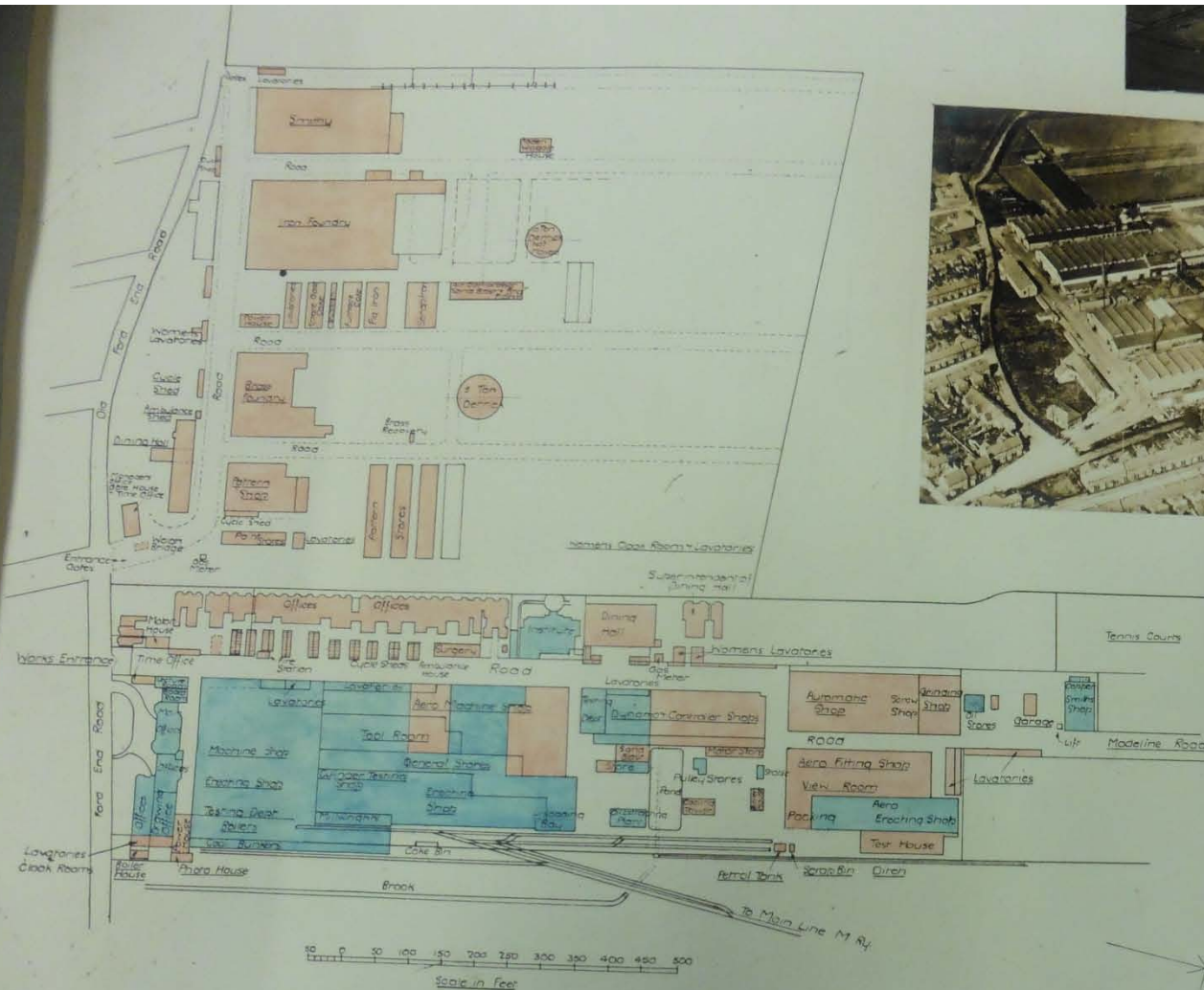
This all changed in the early part of 1915 when the Company was urgently called upon by the War Office not only to accelerate and increase production for the Navy, but also to undertake the manufacture of urgently needed aero engines.

A new 20 acre site in the parish of Biddenham was purchased and cleared in a very short time. Within 3 months of the date of purchase a new brass foundry was built and production established. A new well lit smith's shop was built and all the heavy machinery was transferred and working in record time. This was followed by a new iron foundry, which enabled the old foundry to be converted to give urgently needed space in the very congested Admiralty erecting shop. Finally a new office building, separate dining halls for men and women and various other auxiliary buildings were built making the Biddenham site fully self-contained by the end of 1916.

Building of Biddenham Works 1915



SEE ALSO OVERLEAF



W.H. ALLEN, SONS & Co., Ltd.
 ENGINEERS & BUILDERS
 BEDFORD.
 Drawing No. 40315 F2364
 Date July 27th 1918
 W.H.

F2364

In 1934 due to economic factors and centralised control it was decided to transfer these departments to the Queen's Works site.



Biddenham Site
1920's

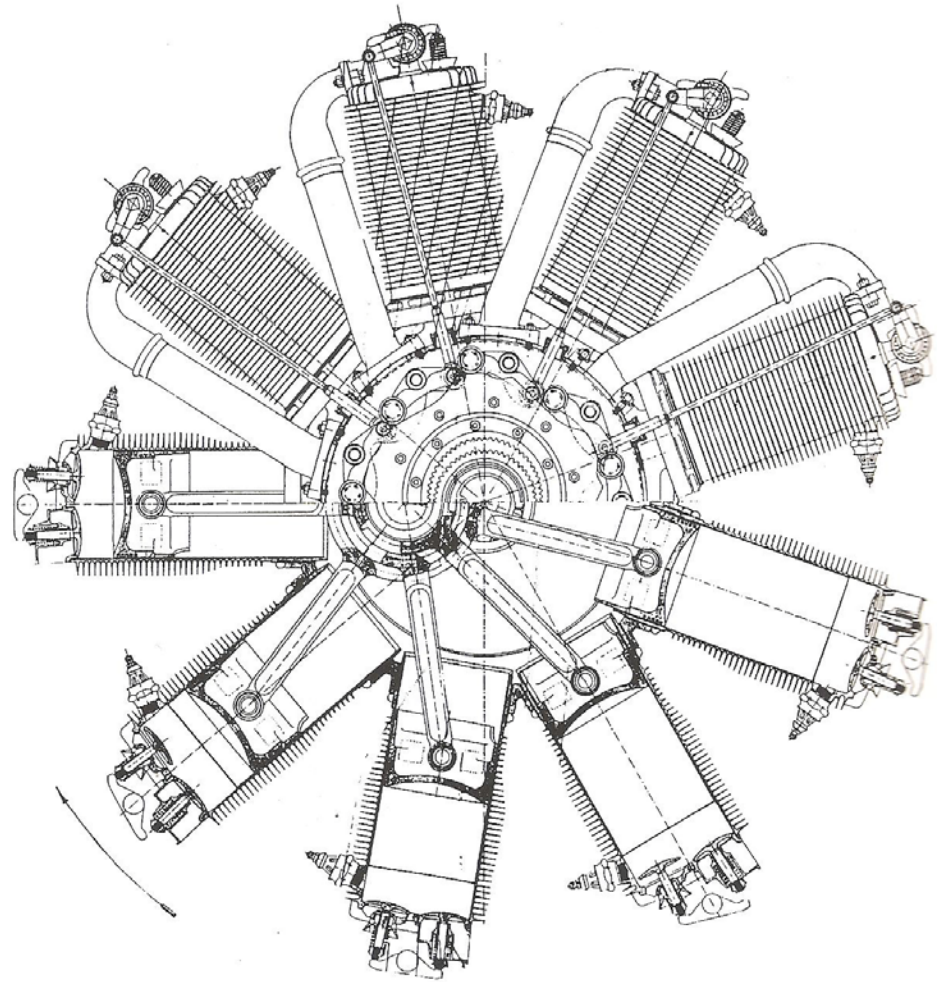


Queen's Engineering
Works 1920's

Le Rhone Gnome aero engine

In September 1915, Richard Allen reported to the Board that the War Office had approached the Company with a view to it manufacturing the 80 hp 9-cylinder Le Rhone Gnome engine.

Apparently, following an earlier visit to Farnborough the Company had been under consideration for the manufacture of a new in-line aero engine designed by the Royal Aircraft Establishment. This had been rejected by the War Office who now proposed that Allen should take over a contract already placed with Peter Hooker Ltd. Of Walthamstow for 100 Le Rhone engines.



Section through a 9-cylinder Le Rhone rotary aero engine. The cylinders were manufactured from a solid steel billet.

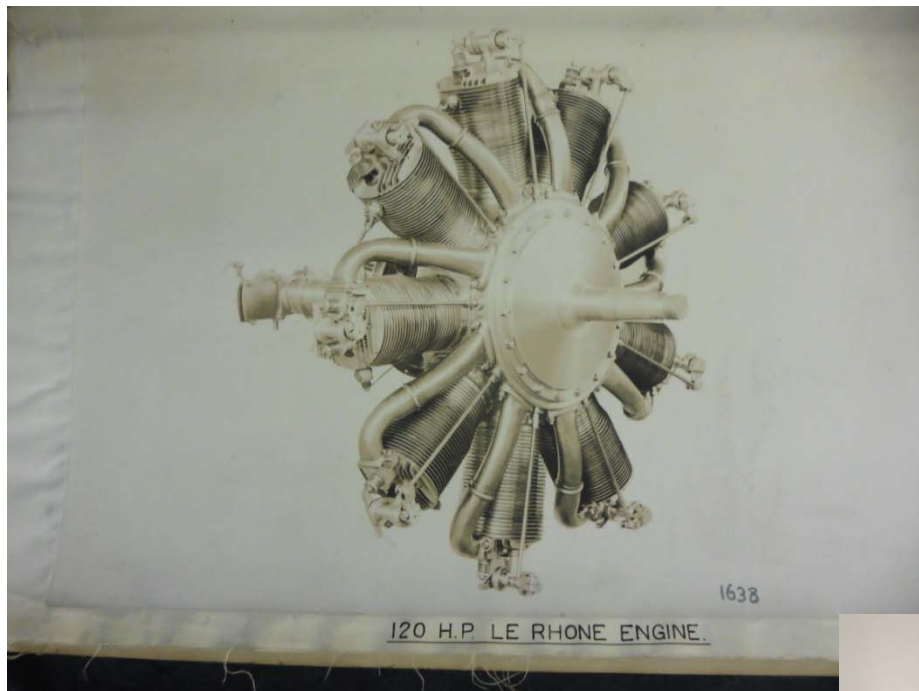
Le Rhone Gnome aero engine

The war office stipulated that the order must be accomplished at the rate of three engines per week starting in February 1916.

The first engine was dispatched in March 1916. During the next two and half years a total of 3,221 engines plus spares were delivered having an aggregate of 386,520 hp and a value of £3 million.

Each engine comprised 1,156 components, the great majority of which were produced in Queen's Engineering Works. [Le Rhone](#)







Aero Engine Fitting Shop



Aero Jig & Tool Design Department



Aero Machinists



Aero Milling Department – Over 50% Women



Aero No. 9 Capstan Department



Aero Engine Details Department – 99% Women



Aero Thread Shop

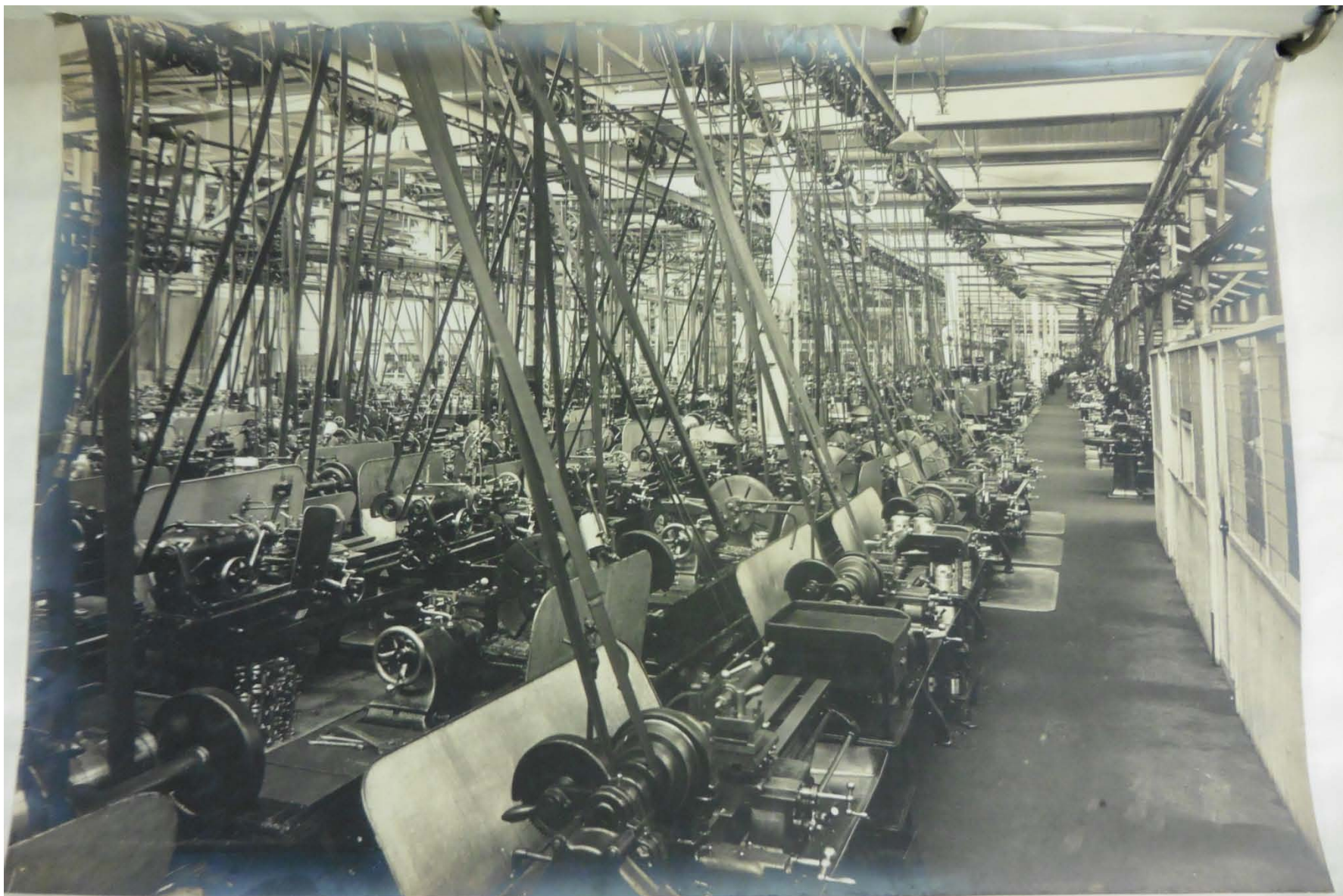


Aero Drilling Department

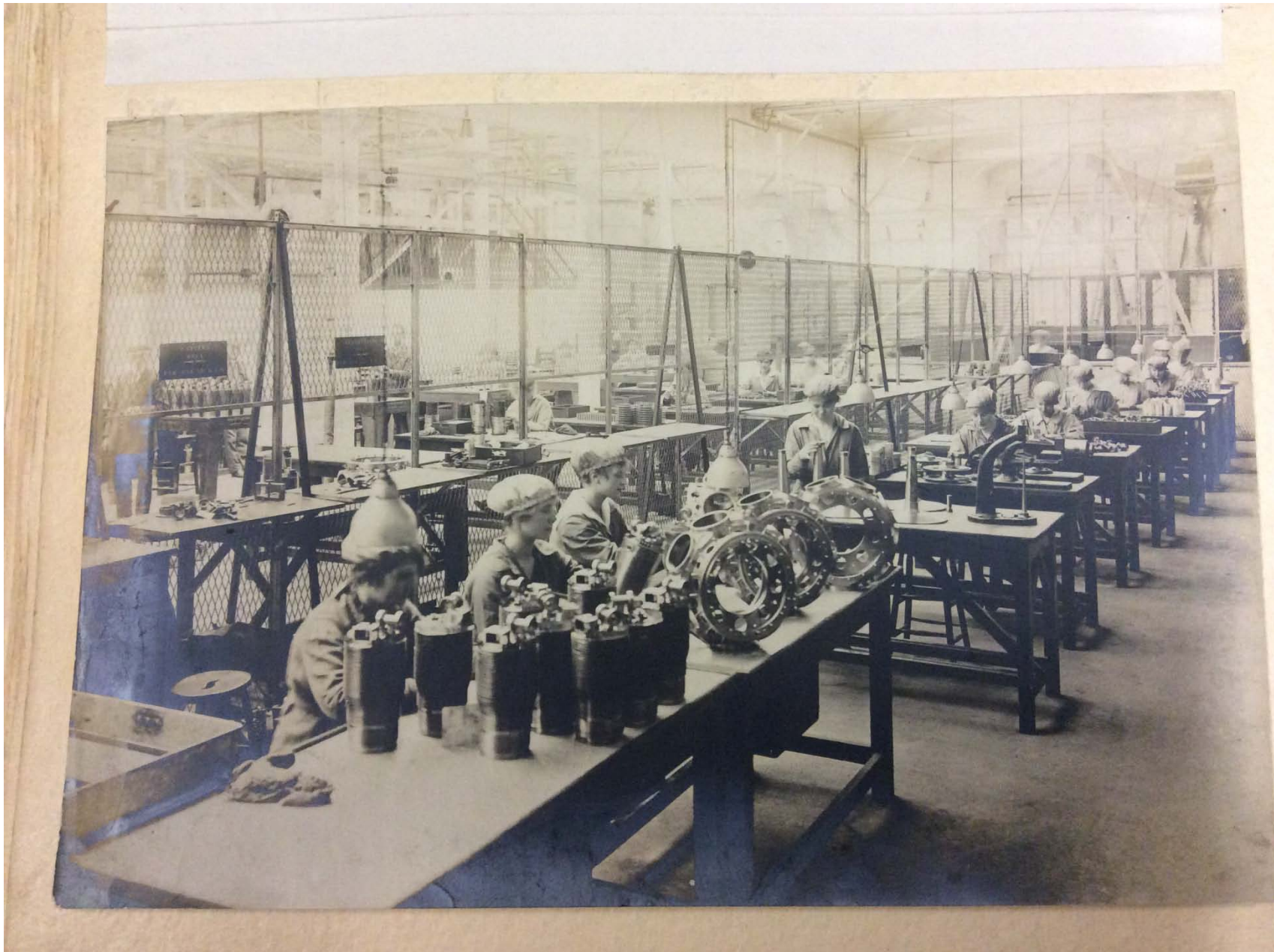


AERO INSPECTION STAFF
Y. H. ALLEN, Supt. & Col. Q. J. M. ALLEN, ENGINEERING WORKS
BEFORE THE 1916

Aero Inspection Staff



AERO MACHINE SHOP.



Aero Details Shop



Aero Machine Shop



AERO TEST HOUSE.

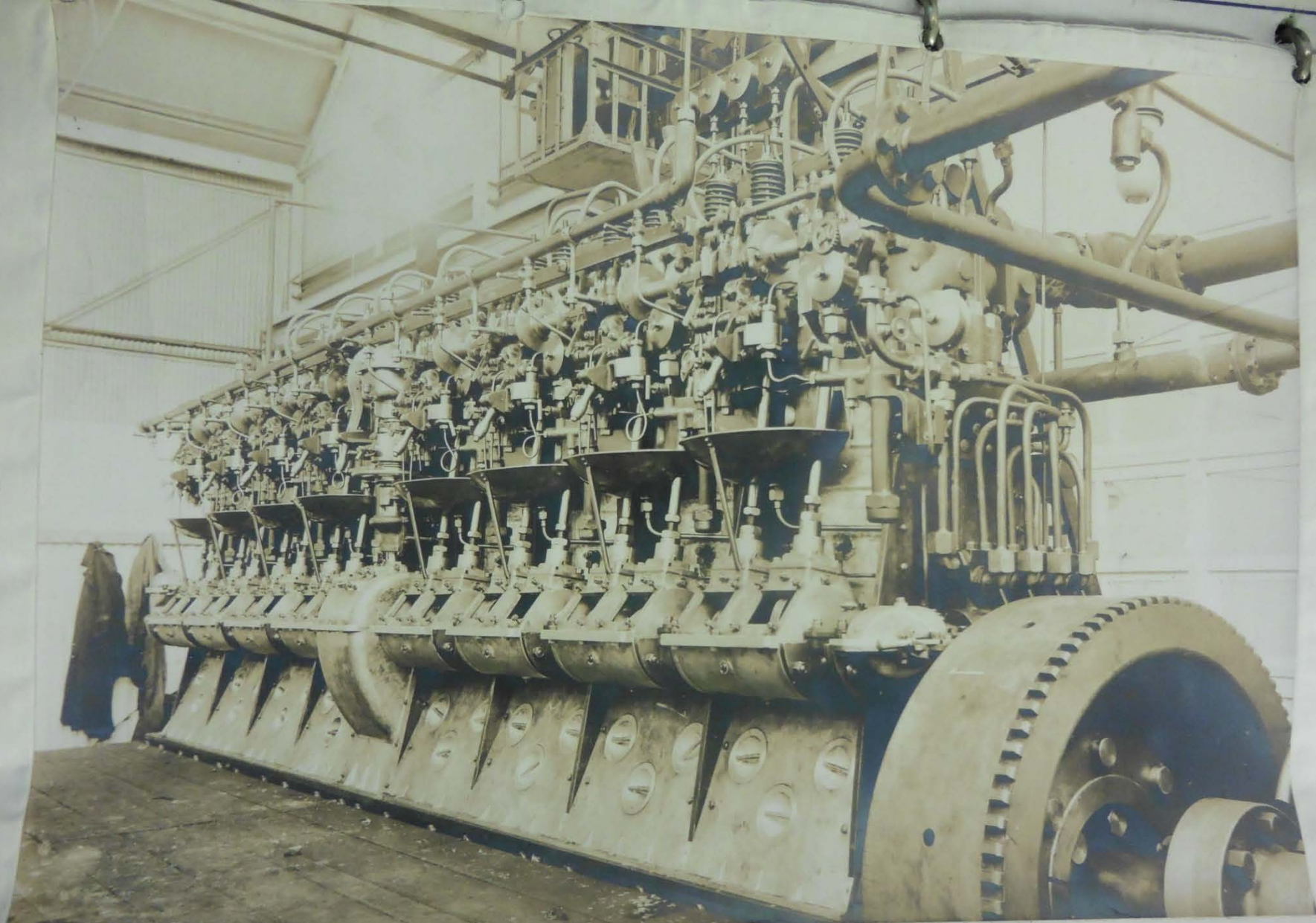


AERO PACKING DEPARTMENT.

War Effort continued

In 1915 due to a critical shortage of engines, the Admiralty requested both Allen's and Belliss & Morcom to undertake the manufacture of main propulsion solid injection air blast engines for submarines. These were Vickers design having 8 cylinders developing 800 hp.

Allen's completed the first engine in seven months, building a total of three. At a subsequent function the Engineer-in-Chief of the Fleet commented "Whenever this Company has been called upon to produce machinery out of the ordinary, they have always done it in the time required"



SUBMARINE ENGINES.

LOWEYER ENGINES.

War Effort continued

Other types of main propulsion machinery undertaken by Queen's Engineering Works during WW1 were:

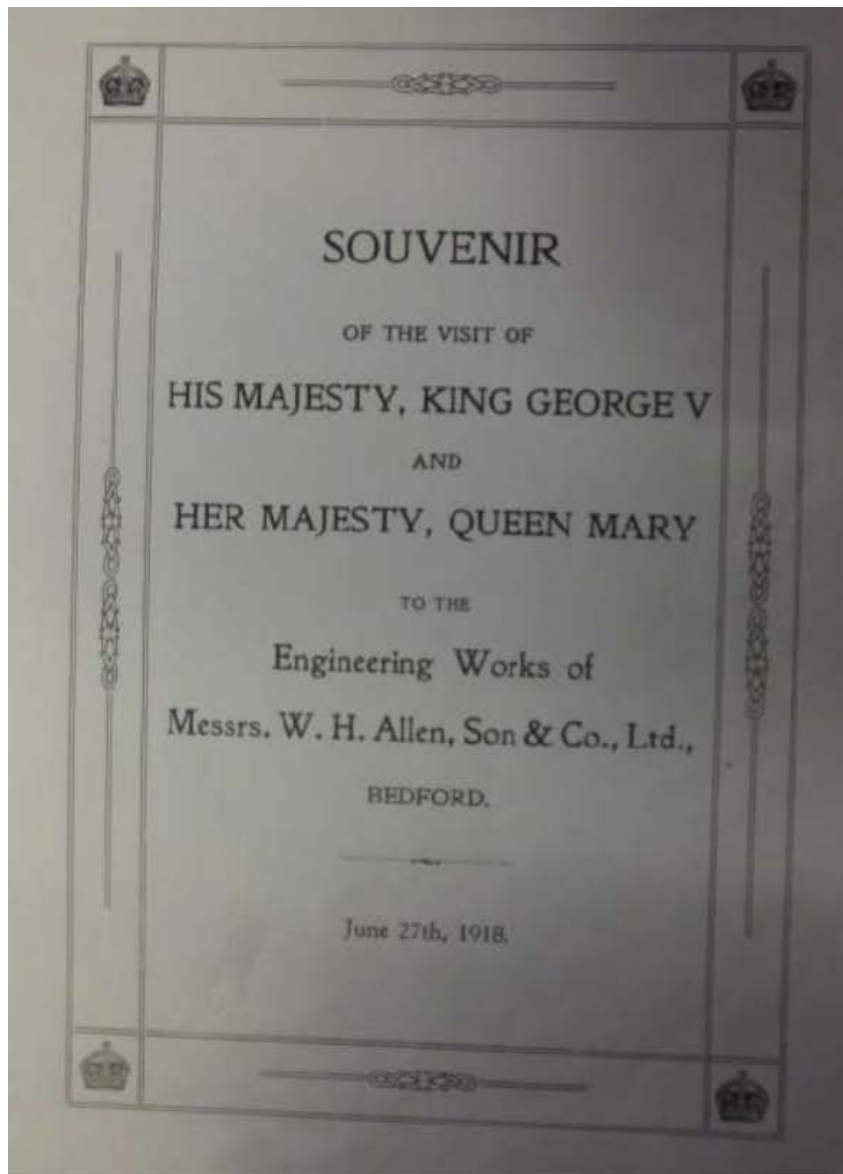
- 16 sets of geared steam turbines for patrol boats.
- 2 cruising turbines for destroyers
- 24 triple expansion reciprocating engines for minesweepers
- 14 sets of trawler engines

More traditional products completed for the Admiralty were:

- 645 sets reciprocating steam engines and dynamos
- 581 sets reciprocating steam engines and turbine circulating pumps
- 749 sets of fans and engines (reciprocating and turbine driven)
- 244 paraffin oil engines driving alternators or salvage pumps

In 1919 W. H. Allen commented “ None of us realised in the spring of 1915 what this work would develop into. We had in mind the turning out of a few engines a week, but the Government required more of us than that, and pressed us to continually to redouble our efforts, until we assumed almost gigantic proportions, and were dispatching an equivalent of over 200 engines per month in completed engines and spare parts”.

Royal Visit



In June 1918 the works were honoured by a visit from King George V and Queen Mary in recognition for their work done for the war effort.

This was their first port of call in a day long visit to Bedford.



Royal Visit



In June 1918 Queen's Engineering Works were honoured by a visit of their Majesties King George V and Queen Mary. W.H. Allen is seen here escorting Her Majesty through the Works yard.

Royal Visit



The royal party leaving the aero stores.



The King presented to Miss Wootton representing the women workers.



Inspecting the Admiralty works.



The Royal Car Driving down the Works Road.

Allen Park

- The day after the Royal visit, the Company announced the establishment of a new Recreational Club on a 10 acre site adjacent to the Biddenham Works.
- They undertook to provide first class cricket pitch to County Ground standards complete with a splendid new pavilion.



Women at Work

	Men	Boys	Women	Total
Fitting shop	179	47	62	288
Machine shops	806	133	561	1500
General shops	20	5	13	38
Test bay	25	-	3	28
Packing bay	35	-	46	81
Tool room	143	16	29	188
Dynamo shop	58	39	30	127
Millwrights	145	3	10	158
Wiremen	28	1	5	34
Controller shop	20	12	7	39
Iron foundry	175	6	25	206
Brass foundry	79	6	32	117
Pattern shop	51	6	4	61
Smiths' shop	71	25	20	116
Offices	195	31	187	413
Total	2030	330	1034	3394

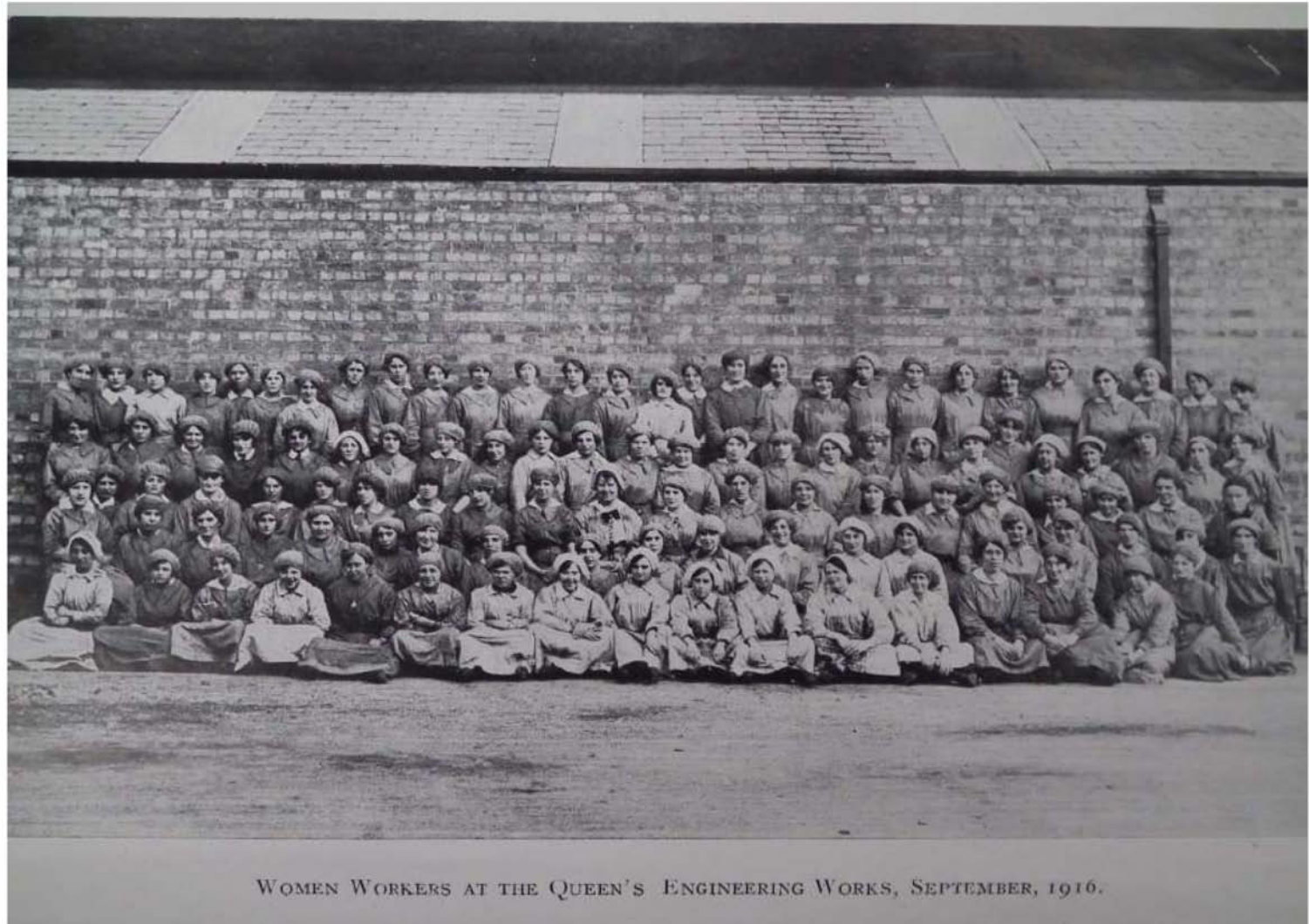
Towards the end of the war, the total workforce varied between 3000 and 3500, of which around a third were women workers.

This snapshot of the workforce in early 1918, which breaks down into each different department, shows that women were represented in every type of work going on in the factory.



Working in the Admiralty shop 1918.

Women at Work



WOMEN WORKERS AT THE QUEEN'S ENGINEERING WORKS, SEPTEMBER, 1916.

Women at Work



THE NEW DINING HALL FOR WOMEN.

By 1917, around 700 women were being employed in the two factories, and new facilities were needed. The new dining hall for women was opened on Hurst Grove in June 1917.

By now women were doing nearly every job previously male only and for some precision work involved in assembly of aero engines they were considered better suited.

Opening tea party
June 18th 1917



IN THE NEW BRASS FOUNDRY.



Banding the armature
of an Electric Motor
in a Banding Lathe.



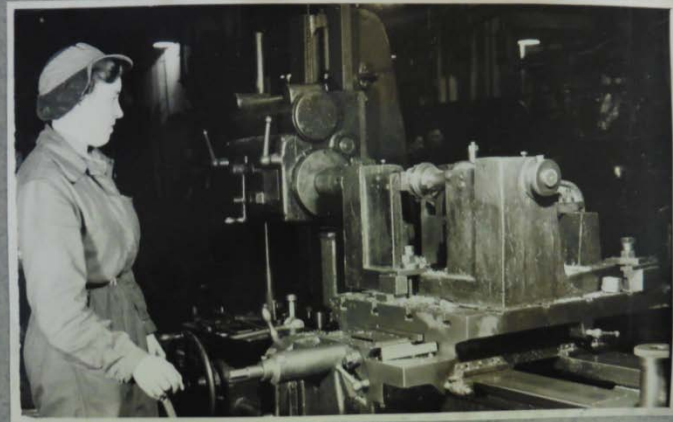
PU 374/94

Females are employed on
a wide range of opera-
tions in the manufacture
Electric Motors and
Control Gear for Marine
machinery, to which they
quickly adapt themselves.
Photograph shows assem-
bly of discs on Armature
Hub for a 300 K.W. Elec-
tric Generator.



Females in the Foundry.

Mixing sand in Rotary
Mixing Machine.



The photographs on this
page show two views of
important Boring and
Facing operations on
Gun Mounting Trunnion
brackets which are
carried out exclusively
by female labour.



Blading the Rotor wheel
of a Steam Turbine.



In the Main Erecting
Shop, females are ass-
isting skilled men on
the fitting and erection
of important Naval mach-
inery. This worker is
fitting the crankshaft
door of a Diesel Engine



In the manufacture of
A.A. Gun Mountings, fem-
ale labour is employed
to a considerable extent,
both in machining oper-
ations and in assembly
and Erection for which
a high degree of accuracy
is required.



The driver of a 15 ton
overhead electric trav-
elling crane watching
her load. Her crane
serves part of the Main
Engine Erection Shop
and great care and acc-
uracy is essential in
the operation of this
crane.

The Difficult Years 1919-34

- Events moved quickly following the signing of the Armistice in November 1918 and resulted in the cancellation of most Government contracts.
- By 1921, the Chairman was reporting the worst year's trading in his living memory.
- Some rationalisation became necessary in the works. The old brass foundry, the Jig & Tool Dept., the Automatic Shop and the hardening shop were closed.
- All women engaged during the war and some men were made redundant.
- On a more optimistic note, the Board approved capital expenditure in the Works amounting to £64,000.

The Difficult Years 1919-34

- There was a strong lobby within the firm to concentrate upon types of machinery which would permit volume production for stock, rather than individual bespoke machinery that was already sold.
- The board sanctioned the production of 500 Conqueror Pumps for stock in order to keep the iron foundry busy.
- Immediately after the War ended overseas agencies were re-activated and it was confidently expected that there would be a steady demand for drainage and irrigation pumps in Egypt, India and other overseas markets.

The W H Allen stand at the British Empire Exhibition at Wembley in 1923.



The Difficult Years 1919-34

- The Board further agreed that, henceforth, the Company would concentrate its design and development resources upon the following products:
- Crude Oil Engines
- Steam turbines
- Turbine Driven Generators
- Turbine Driven Pumps & Fans
- Kinetic Pumps for Condensers
- Electric Motors & Starters



William Henry Allen died in September 1926 at Bromham House. A memorial plaque was unveiled in October 1927.



This can still be seen on a house on Hurst Grove next to the road leading to the estate built on the factory site. The original factory gates are also sited in the middle of a play area on this housing estate.

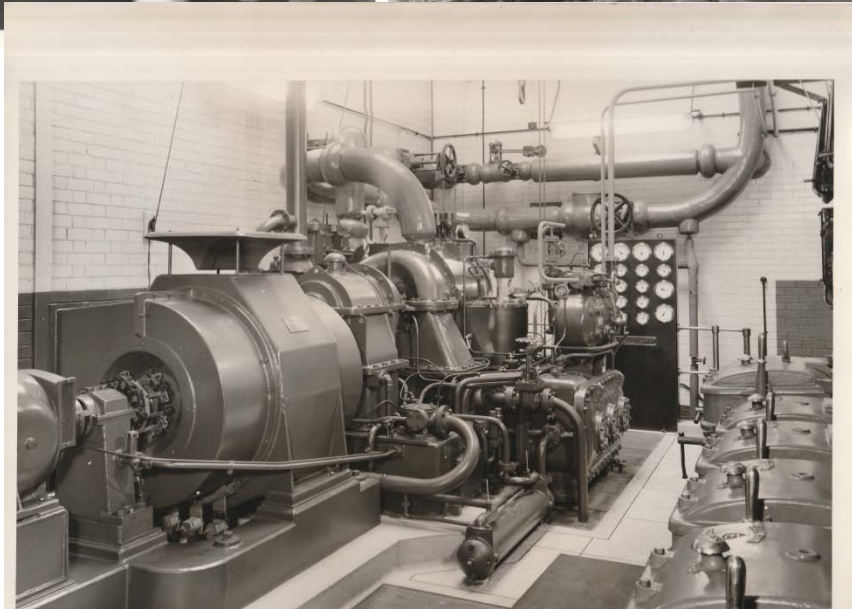
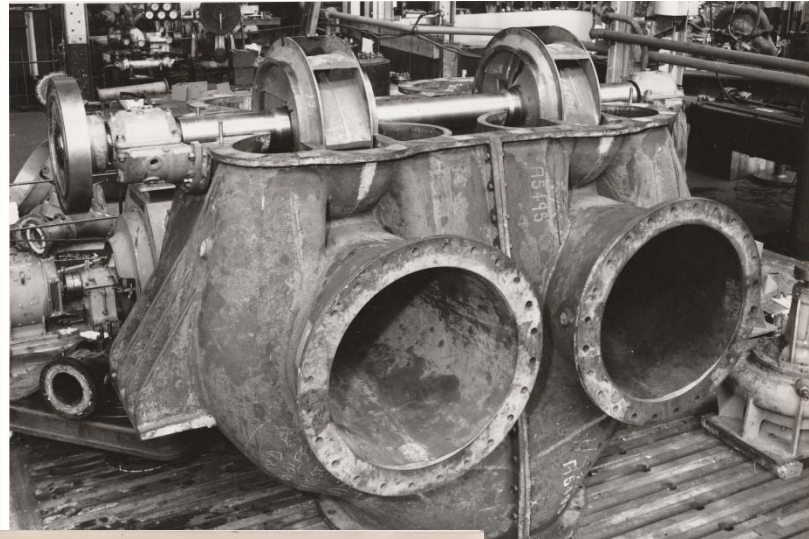
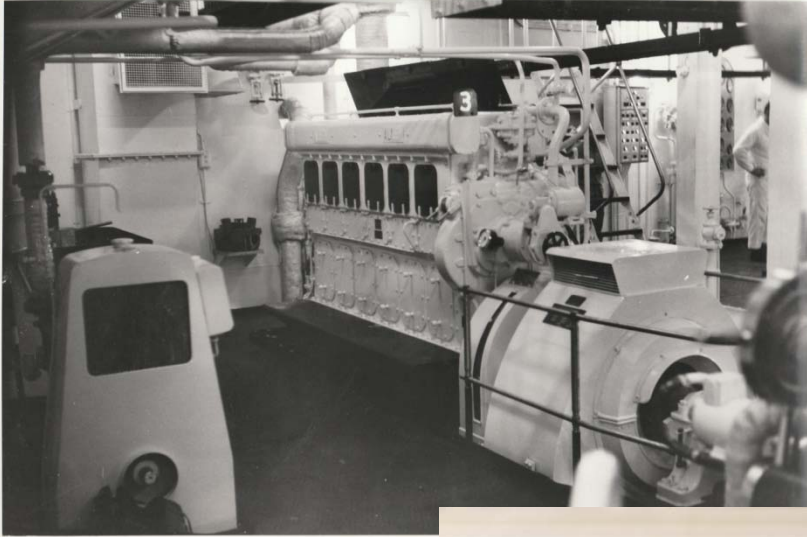
Recovery & Growth 1934 - 50

- At the beginning of 1933 the recovery was still fragile and after much heart searching the Board took the bold decision to transfer all production from the Biddenham Works back to Queens Engineering Works.
- This necessitated the re-erection of the iron and brass foundry, the smiths and plate workers shop and the pattern stores at the north end of the site.
- There was now little demand for the slow-speed 2 stoke heavy oil engine and the diesel engine test bay was re-erected as an extension to the fitting shop.
- This work was completed by the end of October and immediately showed worthwhile cost savings.

Recovery & Growth 1934 - 50

- The total value of orders received by Queen's Engineering Works for the airless diesel engine by the end of 1933 was double that received in 1932; by the end of 1934 the increase was five-fold.
- The Company launched a big sales drive aimed at industries using steam for process and space-heating purposes. They were able to demonstrate conclusively that an Allen turbo-generator incorporating back-pressure and pass-out systems could supply the electricity needs of the user at a fraction of the cost of relying solely upon National Grid electricity.
- Several important new water & sewage contracts were undertaken, & pumps, which were becoming ever bigger and more efficient, formed a very important part of the Company's activities at this time
- The Electrical Department was busy also and new improved ventilated, totally enclosed drip-proof motors were introduced.

Recovery & Growth 1934 - 50



Recovery & Growth 1934 - 50

- Notable orders during mid 1930's;
- Mercantile Marine for diesel generating sets – 125 vessels using 330 diesel auxiliary sets
- Largest single order for turbines, pumps and generators was placed by Metropolitan Water Board, this order alone provided the factory with 2 years work.



The machinery hall at the Metropolitan Water Board's Hampton Station showing the Allen turbine-driven pumping and generating units.

*Lucky is
the Bride
who will
live on the*



QUEEN'S PARK ESTATE

Because

from her point of view the houses are so well planned and labour-saving in every way, and from her husband-to-be's point of view **because** they are the best investment he can make. All Town services are installed and there are **no road, legal or extra charges** whatsoever. Every garden is close boarded all round. All types have a reliable hot water system. Why not take a walk round this Estate now and secure your home for Whitsun?

FURNISHED SHOW HOUSE NOW OPEN

The following types are now ready for occupation.

Type	Price—Freehold	Deposit	Repayments	
"G"	£500	(25)	12.11	Two Bedrooms
"M"	£595	(38)	14.3	Three Bedrooms
"P"	£595	(38)	15.4	Three Bedrooms

QUEEN'S PARK ESTATE

OLD FORD END ROAD, BEDFORD

Agents Office on site from which all particulars can be obtained.

Built by STRUCTURAL CONTRACTORS Ltd, 35 VICTORIA ST. LONDON S.W.1

The early 1930s were difficult times for industry in general. W H Allen's decided to concentrate the business on the original Ford End Road site.

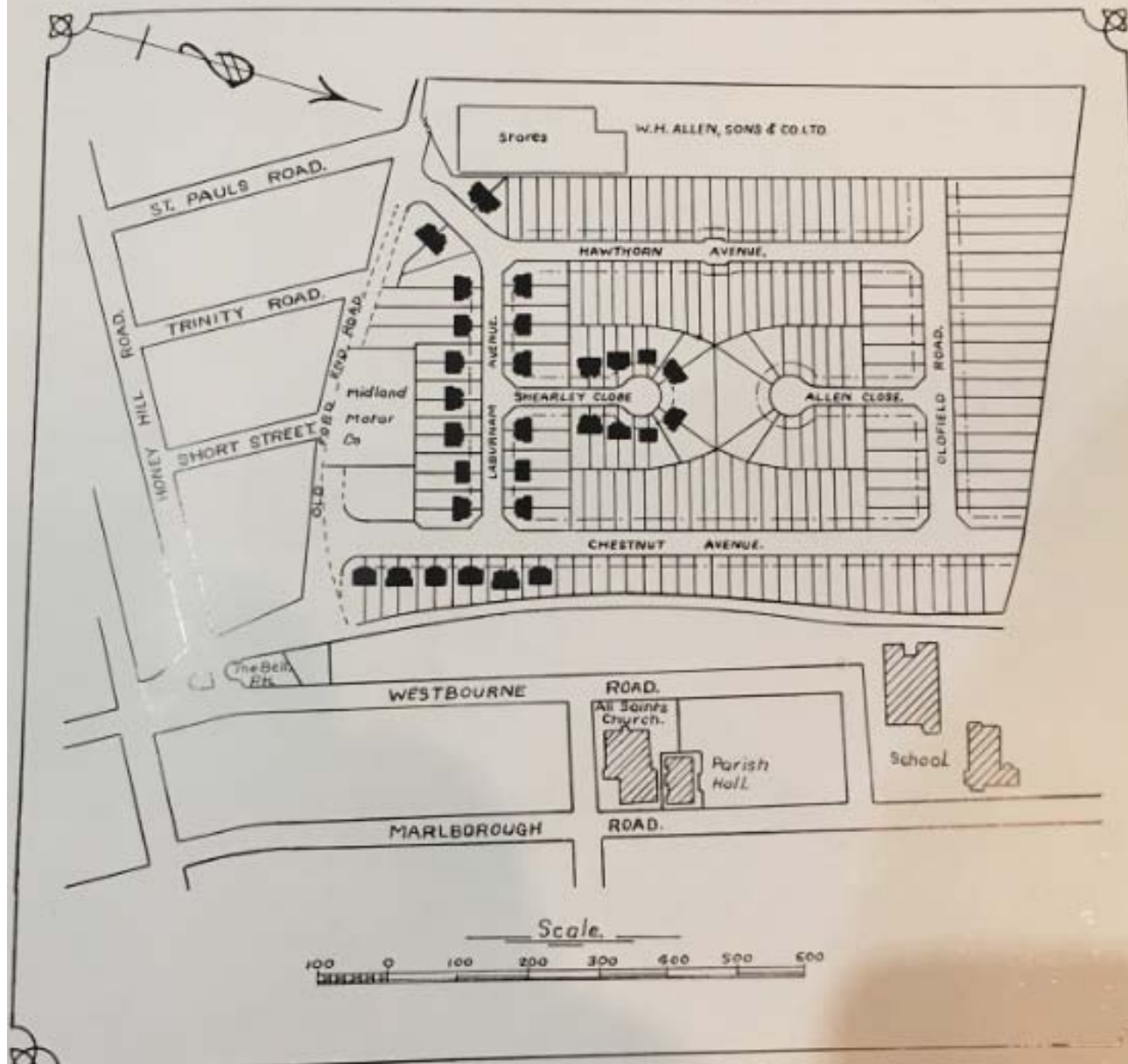
In 1937 the decision was made to sell off 15 acres of land on the Biddenham Works site, to be used to build a housing estate.

Less than a quarter of the original factory remained, and the old main entrance near the Bell was moved to opposite St Paul's Road.



The Queen's Park Estate

(Formerly the Site of Biddenham Works)



Recovery & Growth 1934 - 50

- Harold Allen submitted a report shortly before the declaration of WW2, in which he emphasised that the Company's policy during WW1 had led them into enormous difficulties from which it had taken 20 years to recover.
- They had accepted a large number of orders from the Admiralty & other Government departments thereby forsaking all their commercial customers.
- It was agreed that the Admiralty output would be limited to 60% of the Company's output during WW2.

Recovery & Growth 1934 - 50

- The workforce grew to 3,304 during the war years, of this total 512 were women employed mainly in the machine shops and electrical Department.
- Turn over was increased to over £1.97m.
- During this period the Admiralty made available to the Company machine tools to the value of £1.25m. (later purchased from Admiralty for £163,400)



Workers Take the Road



QUEEN'S ENGINEERING WORKS BEDFORD

This is to certify that

Miss D. M. King Check No. 1890

is

(1) Employee

~~(2) Member of the A.R.P. personnel~~

~~(3) Fire Watcher~~

and is engaged on work of national importance at the premises of

W. H. ALLEN, SONS & CO. LTD.,

It is requested that this person may be afforded every facility to enable him/her to carry out his/her duties.

Signed

Secretary

W. G. Poole Works Manager

Chief Constable, Borough of Bedford



In the event of this card being mislaid or lost, the owner should notify the Works Manager's Department immediately.

A person finding this pass is asked to return it to the Works Manager or to the Police.

Signature of Beaser

[Signature]



Recovery & Growth 1934 - 50

- The list of conventional Auxiliary Equipment manufactured for the navy was impressive:

Steam driven electrical generating machinery

Reciprocating steam engine driven electrical machinery

Steam driven pumps and fans

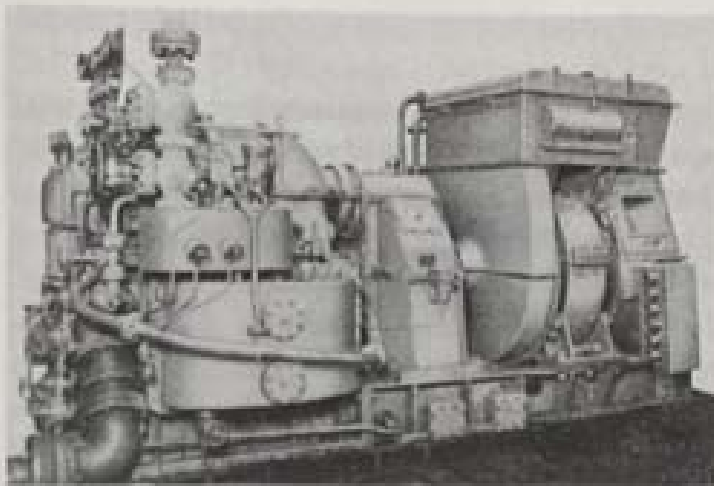
Electrical driven pumps and fans

Steam turbines for steering gear

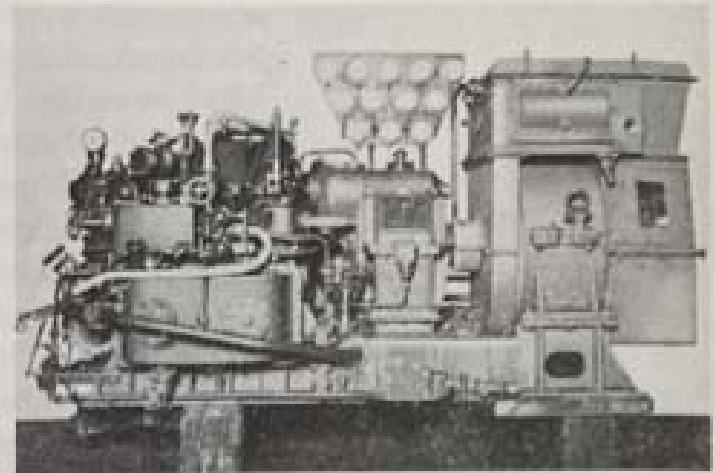
Closed circuit feed water machinery

Electrical machinery

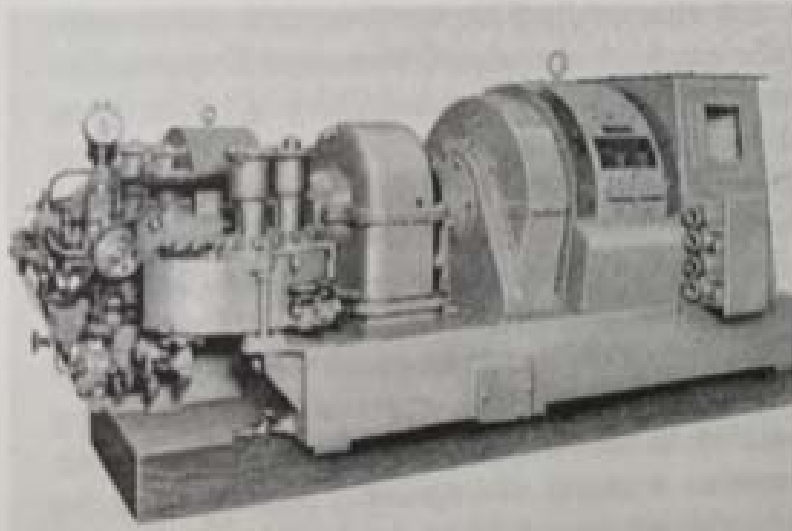
In addition , a large volume of specialised equipment was produced



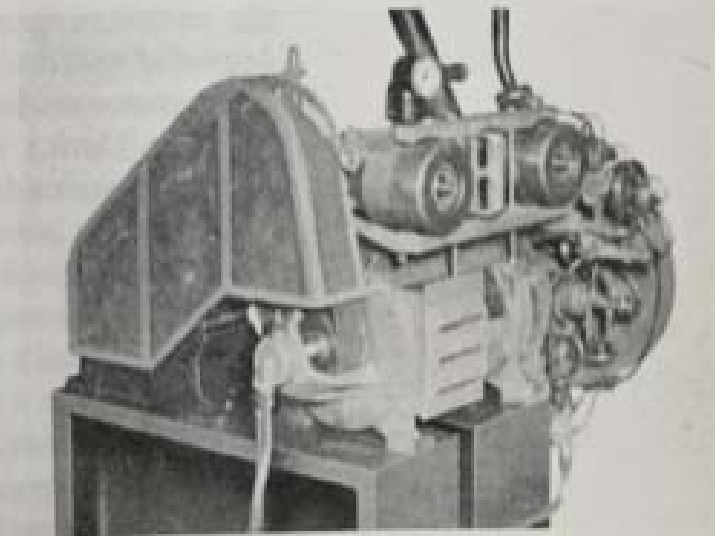
An Allen 500 kW turbo-generator with self-contained condensing plant as installed in British battleships, aircraft carriers and cruisers.



An Allen 200 kW turbo-generator with self-contained condensing plant as installed in Battle class and Weapons class destroyers.



An Allen 60 kW back-pressure turbo-generator as installed in Hunt class destroyers.

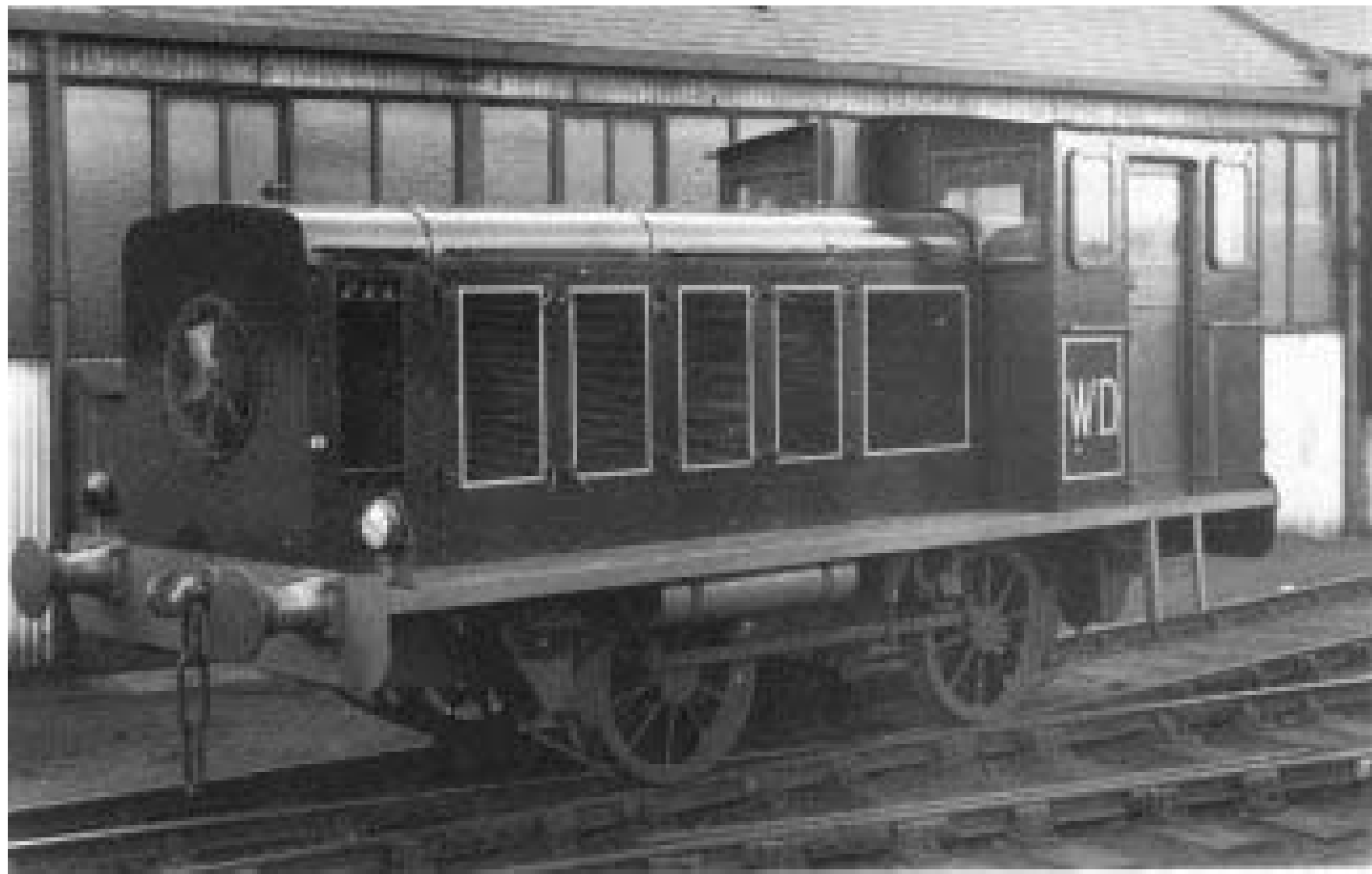


Steam turbine-driven general service unit for steam gunboats. The turbine drives a 10 kW generator, the hydraulic pumps for gun turret operation and the steering gear.





A portable emergency diesel generating set supplied to the Metropolitan Water Board during World War II.



The War Office battery-driven locomotive converted by Allens to diesel-electric drive and fitted with a 5-cylinder 110 bhp at 1,200 rpm airless injection diesel engine and d.c. generator.



Ford Shunter

War Effort

- The total invoice value of the output of Queen's Engineering Works during the war years 1939-1945 was £12.22 million.
- Honours awarded to staff in recognition of the Company's magnificent performance;
- Richard W Allen – knighthood
- R J Fairy & D J Radcliffe – British Empire Medal
- G C Ibbott, H S Glass & A H Fitt – Membership of the British Empire
- W G Poole & T Golding – Order of the British Empire
- The Company received letters of commendation & appreciation for its efforts from the First Lord of the Admiralty, the Chief Engineer of the Fleet & the Minister of Production.